

size and opens obliquely upwards, the coronoid process is long as in *Spalax*, the lower incisor runs backwards and outwards, and the thin layer of bone covering its base forms a protuberance (*d*) on the outer side of the condyle (*e*), in this respect resembling both *Rhizomys* and *Spalax*. The descending ramus springs from the under side of the alveolus of the inferior incisor, and not from the outer side, as in the true *Bathyergidæ*. The posterior part of the descending ramus is not directed outwards, as in *Spalax*; but is on the same plane as the horizontal ramus, as in *Rhizomys*. The molar teeth agree closely with those of *Spalax*, as well as with *Bathyergus*, being nearly cylindrical, of equal size, and having but one external and one internal fold of enamel; the incisors are proportionally broader than in *Spalax*.

The great difference between the skull of *Bathyergus splendens* and that of *Spalax typhlus* consists in the form of the occiput, it being vertical in the former, or very nearly so; but I very much suspect that the peculiar form of occiput which we observe in *Spalax typhlus* (which is the only species of the genus the skull of which I have seen) does not constitute a character indicative of affinity. I think it very likely to vary in the different species of the genus.

On the whole, it appears to me, that the animal called *Bathyergus splendens* by Ruppell should be removed from the genus in which he has placed it, and might be arranged either with the species of *Spalax* or perhaps between that genus and *Rhizomys*, and I think it probable Rodents may hereafter be found connecting the *Bathyergidæ* with these genera.

EXPLANATION OF PLATE II.

Fig. 1. Skull of *Orycterus maritimus*.

- 1 a. Under side of do.
- 1 b. Under side of lower jaw.
 - a. Descending ramus.
 - b. Alveolus of incisor.
- 1 c. Lower jaw viewed from above.
- 1 d. Side view of do.

Fig. 2. *Bathyergus capensis*.

Fig. 2 a. Lower jaw of *Bathyergus capensis*, viewed from beneath.

2 b. Side view of do.

Fig. 3. *Bathyergus splendens* of Ruppell.

3 a. Side view of skull.

3 b. Lower jaw, view from above.

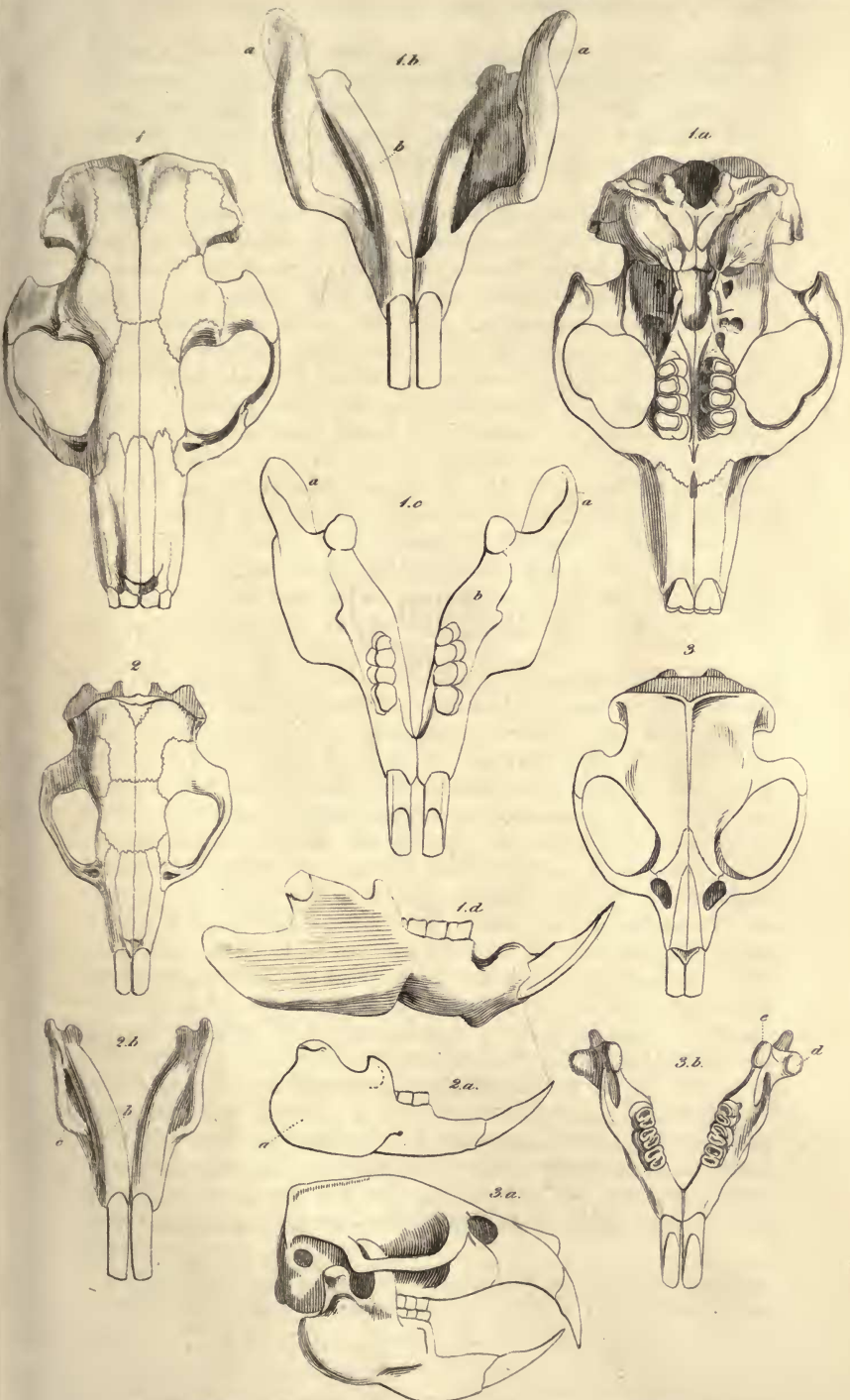
d. Termination of incisor.

e. Condyle.

X.—*Observations* on the Functions performed by the Hairs on the Stigma in Campanulaceæ, Compositæ, and other Plants.* By ARTHUR HILL HASSALL, M.R.C.S.L., Corresponding Member of the Dublin Natural History Society.

I HAVE read with much interest some observations by M. Adolphe Brongniart on the 'Functions of the Hairs on the

* The principal of these observations were written during the summer of last year.



1. *Orycterus maritimus*.

2. *Bathyerqus Capensis*.

3. *Bathyerqus splendens* of Ruppell.



Stigma in the Fecundation of Campanulaceæ,' contained in a recent Number of the 'Annals,' and translated by W. A. Leighton, Esq. To this subject, previously to the appearance of these remarks, I had paid some attention. I do not, however, concur in all the conclusions arrived at by that able investigator.

If the flower-bud of any of the Campanulæ be examined a day or two prior to the expansion of the corolla, the stamens will be observed to envelope and conceal the whole surface of the pistil. If it be again examined, about the period of the unfolding of the blossom, the anthers may be seen to open and disclose their contents. As soon as this has occurred, the stamens having performed the office allotted them, begin to wither away, in consequence of the juices destined for their nourishment being now directed into a new channel. The pistil, immediately on the dehiscence of the anthers, increases rapidly in size, carrying with it in its upward progress, (as by a brush) by means of the hairs upon its surface, the pollen granules. This increase, amounting frequently to thrice the original length of the pistil, arises, partly, from the excitation of the new action now set up in it, but mainly from the accession of the nutriment formerly sent to the stamens, but now no longer required by them.

These hairs are found in all the Campanulaceæ, save only the small genus *Petromarula*, extending from the base of the style to the apex of the stigma, externally, and arranged in lines, corresponding in number and position with the stamens; they are directed horizontally and slightly curved at their extremities. Their surface is lubricated by a secretion, or perhaps, I should rather say, an exudation, serving to retain the pollen in contact with them. The office performed by these hairs is undoubtedly purely mechanical, acting, first, as collectors of the pollen, and subsequently, as props, to sustain it in contact with the fecundating surface—entangled amidst the hairs it is not readily scattered or disturbed. Adolphe Brongniart's account of the anatomy of the hairs I consider to be satisfactory; although I do not deem his comparison of their retractile movements to that of certain Annelides, or the tentacula of snails, to be at all analogous, the phenomenon in the latter cases being *voluntary* and *vital*, the result of complex organization; and, in the former, merely mechanical, presenting nothing peculiar or extraordinary in its nature, but arising simply from the absorption or drying up of the fluid contained in the hair itself, and in the expansion at its base*.

* The retraction of the hairs does not take place until some days after the application of the pollen, the greater part of which then falls off in con-